REMARKS

Claims 1-4, 6-7, 11-17, and 25-28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yorikatsu et al. (U.S. Patent No. 3,658,713) (hereinafter "Yorikatsu") in view of Tsutomu et al. (Japanese Patent Application 06-231727) (hereinafter "Tsutomu"). Claims 5 and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yorikatsu in view of Tsutomu and further in view of Suzuki (Japanese Patent Application 55-078436) (hereinafter "Suzuki"). Claims 8-9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yorikatsu in view of Tsutomu and further in view of Suyama et al. (U.S. Patent No. 6,198,221) (hereinafter "Suyama"). Claim 10 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Yorikatsu in view of Tsutomu and Suzuki and further in view of Suyama. Claims 18, 20-22, and 29-31 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yorikatsu in view of Tsutomu and further in view of Bradley (U.S. Patent No. 3,761,614) (hereinafter "Bradley"). Claim 19 and 32-34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yorikatsu in view of Tsutomu and further in view of Bradley and further in view of Suzuki. Claim 24 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Yorikatsu in view of Tsutomu and in view of Suzuki and further in view of Bradley. These rejections are respectfully traversed for at least the following reasons.

In the Office Action, at page 3, the Examiner concedes that (a) "Yorikatsu is silent regarding an oxidizer comprising at least one vanadate with an alkali metal ion as a counter cation." However, the Examiner then goes on to assert that (b) "[i]n the same field of endeavor of discharge tubes and generating agents, Tsutomu et al. teaches an oxidizer comprising at least one vanadate…to improve luminance and lifespan of the device." As a result, the Examiner concludes that (c) "it would have been obvious to one of ordinary skill in the art at the time of

the invention of modify the alkali generating agent of Yorikatsu with an alkali metal ion as a counter cation...in order to provide a device with a negative pole material with stable pole material to improve luminance and lifespan of the device as taught by Tsutomu." Applicants respectfully traverse this rejection for the following technical reasons which will now be discussed in detail.

First, in the above quoted item (b), the Examiner asserts in the Office Action that discharge tubes and generating agents are both included in the same field of endeavor. Applicants respectfully traverse such an assertion as being technically inaccurate because discharge tubes are understood by those having ordinary skill in these technologies as being active devices such as a light source while generating agents, on the other hand, are understood as being utilized for producing passive devices such as a photomultiplier that includes a photocathode and a plurality of electron emitting surfaces. Applicants respectfully submit that it is well-known by those having ordinary skill in the art that such a generating agent is unnecessary and has no function for a completed passive device such as a photomultiplier.

Second, the advantage of vanadate is described by the Examiner in the above-quoted item (b) as being based on a comparison between a conventional negative pole material of caesium compound-immersed nickel base and a negative pole material of vanadium acid caesium in Tsutomu. On the other hand, however, Applicants respectfully submit that the conventional material to the claimed invention is chromate (chromium acid alkali) because the instant application is directed to an alkali metal generating agent (passive device) field of endeavor, instead of the flash discharge tube (active device) field of endeavor of the applied Tsutomu reference.

In addition, Applicants respectfully submit that in the above-quoted item (c), the Examiner applies the same motivation as item (b) in order to combine Yorikatsu with Tsutomu. However, Applicants respectfully submit that the use of such a motivation is clearly technically incorrect because it is not based on a comparison between the conventional material (chromate) shown in Yorikatsu and the vanadate shown in Tsutomu. Applicants respectfully submit that both chromate and vanadate have sufficient chemical properties to be utilized as an oxidizer of an alkali metal generating agent. The specification of the instant application refers to chromate in paragraphs [0008]-[0012], and it does not disallow the chemical properties themselves of chromate. It simply teaches that the handling of chromate is difficult when using chromate as an oxidizer of an alkali metal generating agent. Applicants respectfully submit that this matter has roots in the fact that a production technique level of a photocathode or an electron emitting surface is low, and the claimed invention of the instant application has been achieved in an effort to overcome the low level production technique. For at least the foregoing reasons, Applicants respectfully submit that the combination rejection in the Office Action is not based on a technical understanding held by persons having ordinary skill in these divergent fields of endeavor.

To ensure a clear understanding of Applicants foregoing remarks, these distinctions will now be further discussed in more detail. Applicants respectfully submit that the claimed invention of the instant application is directed to an alkali metal generating agent that generates an alkali metal vapor by oxidation-reduction reaction between an oxidizer and a reductant. As the Examiner indicates at pages 2-3 of the Office Action, Yorikatsu concerns an alkali metal generating agent, but Yorikatsu is silent as to any teaching of an alkali metal generating agent including a vanadate (vanadium acid alkali) as an oxidizer.

The Examiner then applies Tsutomu in combination with Yorikatsu as allegedly curing these deficiencies. However, Applicants respectfully traverse this combination, as discussed previously, because while Tsutomu describes vanadium acid caesium it is described in Tsutomu as an electron emitting material. More specifically, Applicants respectfully submit that in Tsutomu, vanadium acid caesium powder is disclosed as being molded and sintered to be specifically utilized as a negative pole material of a flash discharge tube. However, Applicants respectfully submit that Tsutomu simply teaches vanadium acid caesium as an electron emitting material, and therefore such a negative pole of the flash discharge tube arrangement of Tsutomu does not, to any extent, generate an alkali metal vapor (caesium vapor) as in the instant application.

More particularly in this regard, Applicants respectfully submit that paragraph [0006] of Tsutomu describes that the negative pole to be produced includes no reductant. Applicants note that if an alkali metal vapor was generated from the negative pole in Tsutomu, an electron emitting ability of the negative pole would be completely lost. Therefore, Applicants respectfully submit that one having ordinary skill in the subject art would clearly understand that the negative pole of vanadium acid caesium in Tsutomu can not and should not generate an alkali metal vapor within a discharge tube. At least for this reason, one having ordinary skill in the art would not be led to made the Office Action's asserted combination.

On the other hand, as described previously, the claimed invention and the Yorikatsu teach a technique for generating an alkali metal vapor by using oxidation-reduction reaction. In contrast, Tsutomu teaches a technique using vanadium acid caesium itself to an electron emitting material without generating an alkali metal vapor (the vapor must not be generated in Tsutomu as previously described).

Applicants respectfully submit that the Assignee company of the instant application, Hamamatsu Photonics K.K., produces both photoelectric tubes and flash discharge tubes. Accordingly, Applicants respectfully submit that Hamamatsu Photonics K.K. fully qualifies as an entity having significant skill in the relevant fields of art. After careful study of the issues associated with the Office Action's rejection, Hamamatsu Photonics LLP respectfully submits that these device types are significantly different from each other. In this regard, the Examiner alleges in the Office Action that the disclosed vanadium acid caesium of Tsutomu which does not generate an alkali metal vapor can be applied instead of the disclosed chromium acid alkali (chromate) of Yorikatsu which does generate an alkali metal vapor. However, for at least the foregoing reasons, Applicants strongly traverse the Office Action's assertion in this regard as being technically incorrect. In particular, the active device flash discharge tube arrangement of Tsutomu is clearly directed to a divergent field of art from the passive device alkali metal generating agent arrangement discussed in Yorikatsu. By the Office Action's above-discussed indication that the applied references are in the same field of art, it is clear that the Office Action's rejection was based on a technical misunderstanding of the applied references.

Furthermore, Applicants respectfully submit that, as described in the specification of the instant application, even though chromium acid alkali (chromate) is well-known as a world-famous material for generating an alkali metal vapor, vanadium acid alkali (vanadate) has a particular characteristic in that an oxidation-reduction reaction between it and a reductant proceeds slowly as compared with the case of chromium acid alkali. In this manner, even though both chromium acid alkali and vanadium acid alkali have sufficient properties for generating an alkali metal vapor, the claimed invention has been achieved by the inventors of the instant application discovering that vanadium acid alkali has a particular advantage in the field of

producing a photosensitive device such as a photocathode, as compared with the utilization of chromium acid alkali. More particularly, Applicants respectfully submit that even through chromium acid alkali is understood as being an advantageous material rather than vanadium acid alkali in production efficiency, the inventors of the instant application reached the specific novel and unobvious combination of features of independent claim 1 by daringly employing vanadium acid alkali as an oxidizer, even though production efficiency might be sacrificed, in order to obtain the inventors' desired results.

Accordingly, Applicants respectfully assert that the rejections under 35 U.S.C. § 103(a) should be withdrawn because Yorikatsu and Tsutomu, whether taken separately or combined, do not teach or suggest each feature of independent claim 1 of the instant application. As pointed out by MPEP § 2143.03, "'[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art.' In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)."

Furthermore, Applicants respectfully assert that dependent claims 2-34 are allowable at least because of their dependence from independent claim 1, and the reasons discussed previously. With regard to the additionally applied references to various dependent claims, as summarized previously, Applicants respectfully submits that these additionally applied references do not cure the deficiencies discussed previously with regard to Yorikatsu and Tsutomu.

In view of the foregoing, Applicants respectfully request reconsideration and the timely allowance of the pending claims. Should the Examiner feel that there are any issues outstanding after consideration of this response; the Examiner is invited to contact Applicants' undersigned representative to expedite prosecution.

EXCEPT for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. § 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account No. 50-0573. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. § 1.136(a) (3).

Respectfully submitted,

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